Types of Operating Systems

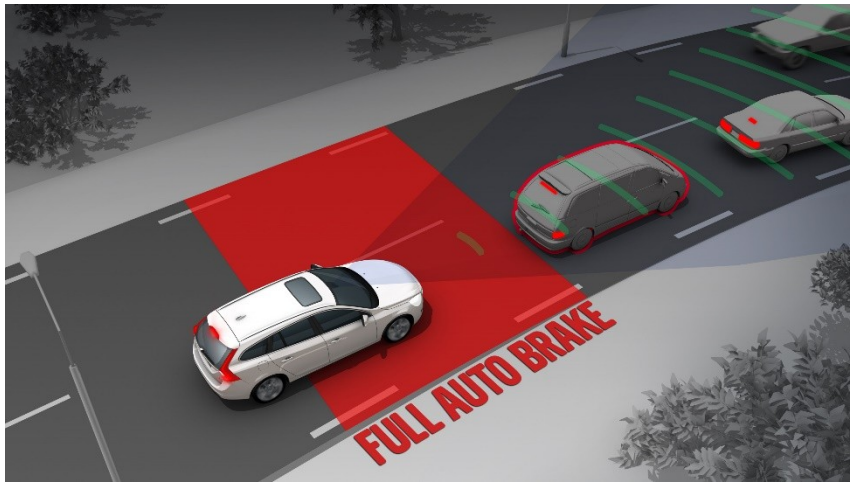
FOUNDATION DIPLOMA IN INFORMATION TECHNOLOGY
YEAR 1

Types of Operating Systems

We all use operating systems daily.

Mobile devices & personal computers

These known as “Single user, multi-tasking”.



Real-Time Operating Systems

Monitors external events and processes data as soon as it enters the computer system.

Allows the computer system to respond immediately to the input.

- E.g. RTLinux, Windows CE & VxWorks.

Single-User, Single-Task Operating Systems

Can only be used by one person at a time, using a single application.

This was very popular in older mobile phones (not smartphones)

Single-User, Multi-Tasking Operating Systems

Designed for only a single user at a time

However, it can run multiple applications simultaneously.

- E.g. Windows 10, Mac OSX & Android.

We commonly used on general purpose computing devices

- Smartphones, tablets and personal computers.

Multi-User Operating Systems

Allows many different users to make use of a computer system and its resources at the same time.

- E.g. UNIX.

Powerful servers, supercomputers and mainframes make use of multi-user operating systems.

Question

1. Identify other example uses of these different types of operating system? (do not include the ones already mentioned)

2. What are the pros and cons of each type?

Answers

Real-Time Operating Systems
- **Easy to maintain:**
- **Supports one user at a time:**.
- **Limited Tasks:**
- **Low multi-tasking**
- **Expensive:**

Single-User, Single-Task Operating Systems
- Requires fewer resources
- Used with devices with limited cpu and memory
- Can only do one thing at a time

Single-User, Multi-Tasking Operating Systems
- Allows users to use several applications
- Can easily switch between apps
- Can use up a lot of memory/cpu
- Slow load up times

Multi-User Operating Systems
- Resources and cpu can be used by multiple users
- Resources can be shared
- Expensive

Types of Operating Systems

We all use operating systems on a daily basis. The mobile devices & personal computers we use on a daily basis all have one installed. Names like Microsoft Windows and Mac OSX are very familiar to us.

These two examples are only one type of operating system though, known as “Single user, multi-tasking”. There are actually a few different types that are more usually used by certain specialist devices.

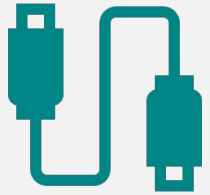
Real-Time Operating Systems

This type of operating system, often written as RTOS, monitors external events and processes data as soon as it enters the computer system. This allows the computer system to respond immediately to the input. Examples include RTLinux, Windows CE & VxWorks.

We see real-time operating systems mostly used in embedded devices (such as traffic lights), automatic systems (such as robotics on a manufacturing line) and aircraft (such as air traffic control systems).

Single-User, Single-Task Operating Systems

A SINGLE-USER, SINGLE-TASK OPERATING SYSTEM CAN ONLY BE USED BY ONE PERSON AT A TIME, USING A SINGLE APPLICATION. SO A DEVICE USING THIS TYPE OF OPERATING SYSTEM CAN ONLY DO ONE THING AT A TIME.



THIS WAS VERY POPULAR IN OLDER MOBILE PHONES (NOT SMARTPHONES) AS WELL AS IN PERSONAL DIGITAL ASSISTANTS, LIKE PALM DEVICES. THIS USED A SINGLE-USER, SINGLE-TASK OPERATING SYSTEM CALLED PALM OS.

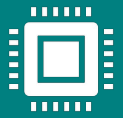
This type of operating system is also designed for only a single user at a time, however, it can run multiple applications simultaneously. Examples of this type of operating system include Windows 10, Mac OSX & Android.

We commonly see this type of operating system used on general purpose computing devices like smartphones, tablets and personal computers. You've undoubtedly had multiple programs going at the same time, like a word processor, web browser, email client & music player. That's because your computer is using a single-user, multi-tasking operating system.

Single-User, Multi-Tasking Operating Systems

Multi-User Operating Systems

A multi-user operating system allows many different users to make use of a computer system and its resources at the same time. An example of this would be UNIX.



Powerful servers, supercomputers and mainframes make use of multi-user operating systems. These devices are extremely expensive and it would not be efficient for them to be used by a single user at once and so we use a multi-user operating system.